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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/479,433	01/07/2000	Sunil Khaunte	CISCP135/1935	3028

22434 7590 07/28/2003

BEYER WEAVER & THOMAS LLP
P.O. BOX 778
BERKELEY, CA 94704-0778

EXAMINER
JUNTIMA, NITTAYA

ART UNIT	PAPER NUMBER
2663	

DATE MAILED: 07/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/479,433	Applicant(s) KHAUNTE ET AL.	
	Examiner Nittaya Juntima	Art Unit 2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *30 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-10,17-21,24-27,34,35,37,38,43-46,48 and 49* is/are rejected.

7)☒ Claim(s) *5, 6, 11-16, 22-23, 28-33, 36, 39-42 and 47* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in response to the amendment filed on May 30, 2003.

1. The objection to specification is withdrawn in view of applicant's amendment.

2. Claims 1-4, 7-10, 17-21, 24-27, 34-35, 37-38, and 43-46 are rejected under 35 U.S.C. 103 (a).

3. Claims 5-6, 11-16, 22-23, 28-33, 36, 39-42, and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Drawings

4. As indicated in the previous Office action, Fig. 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 7, 9-10, 17-21, 24, 26-27, 34-35, 37, 43-46, and **48-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over *"Data-Over-Cable Service Interface Specifications"* by Cable Television Laboratories, Inc. (DOCSIS).

Per **claim 1**, DOCSIS teaches ***an access network*** (cable network in Fig. 3-3, pg. 13), ***a Head End*** (Headend in Fig. 1-2, pg. 3), ***a plurality of nodes*** (Cable Modems, CMs #1-2 in Fig. 3-3, pg. 13), ***an access control system*** (CMTS in Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***a current time reference source*** (a current time reference source is inherently included in the Head End to provide time reference, section 7.1, 1st paragraph, pg. 103), ***at least one downstream channel*** (a downstream channel on fiber connecting between Head End transmitter and O/E node is used by the Head End to communicate with cable modems, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***at least one shared-access upstream channel*** (a shared-access upstream channel on fiber is connecting between Head End transmitter and O/E node and in communication with cable modems, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***a MAP generating device*** (as MAP PDUs must be transmitted by CMTS to the cable modems to define transmission opportunities on the upstream channel, therefore, it is inherent that a MAP generating device must be included in the CMTS to generate MAP for transmission, lines 1-2 and section 7.1.1, pg. 104), ***future allocation start time (SAT)*** (alloc start time, Fig. 6-19, pg. 75), ***a Lookahead Time (LAT) value*** (a Lookahead Time value reads on the difference between t_1 and t_3 where t_1 is a current time value and t_3 is an effective starting time (SAT), Fig. 7-2 and section 7.1.6, pg. 108), ***obtaining propagation delay data*** (propagation delay data reads on the roundtrip propagation delay, initial and periodic ranging processes performed between CMTS and a cable modem (a node or a portion of the plurality of nodes) are used to acquire the timing offset which inherently includes the roundtrip propagation

delay and the processing delay as well known in the art, section 6.3.5, 1st paragraph, lines 1-2, pg. 78, and section 7.3.3, pgs. 110-111).

DOCSIS does not teach ***dynamically adjusting the Lookahead Time value using the propagation delay data***. However, DOCSIS further teaches that the roundtrip propagation delay is included in the LAT value (the roundtrip propagation delay = downstream propagation delay + upstream propagation delay, item 1, section 7.1.6, pg. 108).

Therefore, it would have been obvious to one skilled in the art to use the roundtrip propagation delay obtained from initial and periodic ranging processes to dynamically adjusting the Lookahead Time value which also includes the roundtrip propagation delay in order to periodically reflect any changes in the roundtrip propagation delay in an attempt to minimize the overall delay and achieve the minimal latency of access to the upstream channel.

Claim 17 is a Head End claim corresponding to method claim 1, and is rejected for the same reason set forth in claim 1.

Claim 34 is a computer program product claim corresponding to method claim 1, and is rejected for the same reason set forth in claim 1 with the addition that DOCSIS does not teach a computer usable medium having computer readable code which comprises computer code. However, it would have been obvious to one skilled in the art to include computer code, computer readable code, and a computer usable medium into the claimed computer program product because one skilled in the art would want to improve performance of an access network by automatically executing the computer code which instructs computer to obtain propagation delay data and dynamically adjust the Lookahead Time value, and have such computer code in a

form of computer readable code (1's and 0's) installed in a computer usable medium such as a diskette and CD-ROM for easy implementation and portability purposes.

Per **claim 43**, DOCSIS teaches ***generating MAP messages at a Head End*** (Headend in Fig. 1-2, pg. 3) ***for an upstream channel associated with a plurality of nodes*** (cable modems, CMs #1-2 in Fig. 303, pg. 13) (as MAP PDUs must be transmitted by CMTS to the cable modems to define transmission opportunities on the upstream channel, therefore, it is inherent MAP PDUs must be generated at a CMTS residing inside a Head End, pg. 104, lines 1-2 and section 7.1.1), ***each MAP message*** (pg. 104, section 7.1.1) ***specifying a start allocation time*** (alloc start time, Fig. 6-19, pg. 75) ***determined using a lookahead time value*** (a lookahead time value reads on the difference between t_1 and t_3 where t_1 is a current time value and t_3 is an effective starting time, pg. 108, Fig. 7-2 and section 7.1.6), ***obtaining propagation delay data*** (the roundtrip propagation delay) ***associated with at least a portion of the plurality of nodes using the upstream channel, the propagation delay data for a node*** (a cable modem) ***being obtained from ranging procedures performed between the Head End*** (CMTS which resides in the Headend) ***and the node*** (initial and period ranging processes performed between CMTS and a cable modem are used to acquire the timing offset which inherently includes the roundtrip propagation delay and the processing delay as known in the art, pg. 78, section 6.3.5, 1st paragraph, and pgs. 110-111, section 7.3.3).

DOCSIS does not teach ***dynamically adjusting the lookahead time value using the propagation delay data***. However, DOCSIS further teaches that the roundtrip propagation delay is also included in the lookahead time value (the roundtrip propagation delay = downstream propagation delay + upstream propagation delay, item 1, section 7.1.6, pg. 108).

Therefore, it would have been obvious to one skilled in the art to use the roundtrip propagation delay obtained from initial and periodic ranging processes to dynamically adjusting the lookahead time value which also includes the roundtrip propagation delay in order to periodically reflect any changes in the roundtrip propagation delay in an attempt to minimize the overall delay and achieve the minimal latency of access to the upstream channel.

Claim 48 is an apparatus claim corresponding to method claim 43, and is rejected for the same reason set forth in claim 43.

Per **claims 2, 18, 35, 44,** and **49**, DOCSIS teaches ***determining a minimum propagation delay value corresponding to a farthest on-line node on the at least one upstream channel*** (initial and periodic ranging processes performed between CMTS and a farthest on-line node, i.e. a cable modem CM# 2 in Fig. 3-3, pg. 13 on an upstream channel, are used to acquire the timing offset which includes the roundtrip propagation delay of CM# 2, section 6.3.5, 1st paragraph, lines 1-2, pg. 78, lines 1-3 and section 7.3.3, pgs. 110-111), and ***calculating the Lookahead Time value using the minimum propagation delay value*** (in a case when a farthest on-line node is the first node to communicate with CMTS during the initial and periodic ranging processes, the minimum propagation delay value of a farthest on-line node on one upstream channel would be used to calculate and adjust the LAT).

Per **claims 3, 19,** and **45**, it is inherent that the minimum propagation delay value is a maximum runtime propagation delay for the at least one upstream channel since the minimum propagation delay value is in fact the propagation delay value of the a farthest on-line node with the longest distance from the CMTS on a given upstream channel.

Per **claims 4** and **46**, DOCSIS teaches ***the LAT*** (a Lookahead Time value reads on the difference between t_1 and t_3 where t_1 is a current time value and t_3 is an effective starting time (SAT), Fig. 7-2 and section 7.1.6, pg. 108) ***is calculated by adding a MAP construction delay at the Head End*** (queuing delays within the CMST), ***an interleaver delay*** (PMD-layer FEC interleaving), ***the minimum propagation delay*** (worst-case round-trip propagation delay), and ***a MAP processing delay at a network node*** (CM MAP processing time), (section 7.1.5, pg. 107).

Per **claims 7, 24,** and **37**, DOCSIS teaches that the access network is ***a cable network*** (cable network in Fig. 3-3, pg. 13), ***the plurality of nodes are cable modems*** (Cable Modems, CM #1-2 in Fig. 3-3, pg. 13), ***the access control system is a Cable Modem Termination System*** (CMTS in Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), and ***the propagation delay data corresponds to offset data*** (the roundtrip propagation delay inherently included in the timing offset, lines 1-3, pg. 110, and section 7.3.3, pgs. 110-111).

Per **claims 9-10** and **26-27**, DOCSIS teaches that ranging procedure is ***an initial ranging procedure*** and ***a periodic ranging procedure*** performed between the node (cable modem) and the access control system (CMST) (section 6.3.5, 1st paragraph, lines 1-2, pg. 78 and section 7.3.3, pgs. 110-111).

Per **claims 20** and **21**, DOCSIS does not teach storing a minimum propagation delay value and an optimized LAT value. However, it would have been obvious to one skilled in the art to ***store a minimum propagation delay value corresponding to a farthest on-line node on the at least one upstream channel in the memory*** for the adjustment of the LAT, and to also ***store an optimized LAT value*** (not further defined, therefore, an optimized LAT value reads on the propagation delay of a farthest on-line node – worst case propagation delay) derived from the

minimum propagation delay value so it can be used as a LAT for the farthest on-line node during MAP generation and transmission.

Claims 8, 25, and **38**, are rejected under 35 U.S.C. 103(a) as being unpatentable over *"Data-Over-Cable Service Interface Specifications"* by Cable Television Laboratories, Inc. (DOCSIS) in view of Raissinia et al. (UPSN 6,430,193 B1).

DOCSIS does not teach that the access network is a wireless network.

However, as shown in Fig. 1, Raissinia et al. teaches that the access network is a wireless network (a point-to-multipoint wireless communication network 100, col. 2, lines 4-28 and col. 3, lines 64-67-col. 4, lines 1-23 and 40-54).

Given the teaching of Raissinia et al., it would have been obvious to one skilled in the art to include a wireless network such as a point-to-multipoint wireless communication network in the access network, i.e. the cable network, taught by DOCSIS as they both involve the same concept of access to a shared medium in order to take advantage of low cost hardware and software which are readily available (Raissinia et al., col. 2, lines 29-35).

Response to Arguments

4. Applicant's arguments with respect to claims 1-49 have been considered but they are not persuasive.

A. In the remarks, per claims 1, 17, 34 we well as the new independent claims 43 and 48, the applicant argues that according to DOCSIS, "during the ranging procedure, the cable modem transmits a test signal to the CMTS. When the CMTS received this test signal, it determines a propagation value (commonly referred to as an offset value)...The offset value is then

transmitted by the CMTS back to the cable modem so that the cable modem may adjust the timing of its upstream transmissions in order to compensate for the propagation delay related to the physical distance between the cable modem and the CMTS... Traditionally, however, the stored offset information at the Head End is not used for any other purpose." DOCSIS describes using the propagation value or the offset value for ranging but does not teach or suggest "dynamically adjusting the Lookahead Time value ...using the propagation delay data." Neither the DOCSIS reference nor any other reference cited by the Examiner is believed to have the required explicit suggestion to combine the static initial ranging described in DOCSIS with dynamic adjustment of values.

In response, DOCSIS teaches ***obtaining propagation delay data*** (the roundtrip propagation delay) ***associated with at least a portion of the plurality of nodes*** (a cable modem) ***using the at least one upstream channel, the propagation delay data for a node being obtained from ranging procedures*** (initial and periodic ranging procedures) ***performed between the access control system and the node*** (initial and periodic ranging processes performed between CMTS and a cable modem are used to acquire the timing offset which inherently includes the roundtrip propagation delay and the processing delay as known in the art, section 6.3.5, 1st paragraph, lines 1-2, pg. 78, and section 7.3.3, pgs. 110-111, specifically on pg. 111, lines 3-6).

DOCSIS does not teach ***dynamically adjusting the Lookahead Time value using the propagation delay data***. However, DOCSIS further teaches that the roundtrip propagation delay is included in the LAT value (the roundtrip propagation delay = downstream propagation delay + upstream propagation delay, item 1, section 7.1.6, pg. 108).

As can be seen from the above teaching of DOCSIS that two roundtrip propagation delay values can be acquired from ranging processes; one from an initial ranging process and the other from a 1st periodic ranging process. Therefore, having these two roundtrip propagation delay values available, it would have been obvious to one skilled in the art to use them to dynamically adjust the Lookahead Time value, i.e. adjusting the LAT with the roundtrip propagation delay obtained from an initial ranging process to a new LAT with the roundtrip propagation delay obtained from the 1st periodic ranging process. The process is repeated when another periodic ranging process is performed.

Further the Examiner pointed out in the previous Office action why it would have been obvious to one skilled in the art to use the roundtrip propagation delays obtained from initial and periodic ranging processes to dynamically adjusting the Lookahead Time value which also includes the roundtrip propagation delay because one skilled in the art would want to periodically reflect any changes in the roundtrip propagation delay in an attempt to minimize the overall delay and achieve the minimal latency of access to the upstream channel. Applicant fails to point out the error in the motivation in the rejection. Therefore, the rejection is maintained.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 703-306-4821. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 703-308-5340. The fax phone numbers for the

organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Nittaya Juntima
July 24, 2003
NJ

CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600